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| 09/886,636      | 06/21/2001  | Arihiro Takeda       | 0941.65640          | 6148             |

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EXAMINER

WANG, GEORGE Y

| ART UNIT | PAPER NUMBER |
|----------|--------------|
|----------|--------------|

2871

DATE MAILED: 07/27/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

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|                              |                                      |                                      |  |
|------------------------------|--------------------------------------|--------------------------------------|--|
| <b>Office Action Summary</b> | <b>Application No.</b><br>09/886,636 | <b>Applicant(s)</b><br>TAKEDA ET AL. |  |
|                              | <b>Examiner</b><br>George Y. Wang    | <b>Art Unit</b><br>2871              |  |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 16 May 2005.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1,3-16 and 18-28 is/are pending in the application.
- 4a) Of the above claim(s) 7 and 8 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1,3-6,9-16 and 18-28 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 01 June 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All    b) ☐ Some \*    c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)  | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

## **DETAILED ACTION**

### ***Continued Examination Under 37 CFR 1.114***

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on May 16, 2005 has been entered.

### ***Claim Rejections - 35 USC § 103***

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to

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consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

3. Claims 1, 4-5, 18, 20-21, and 27-28 are rejected under 35 U.S.C. 103(a) as being unpatentable over Konovalov et al. (SID, Society of Information Display, May 17-22, 1998, p. 1127, hereafter "Konovalov") in view of Kodon et al. (U.S. Patent No. 5,790,218, hereafter "Kodon").

4. As to claims 1 and 28, Konovalov discloses a liquid crystal display (LCD) device with a pair of substrates having electrodes, a liquid crystal layer sealed between the substrates (Fig. 1). Konovalov also discloses an insulating layer having a plurality of patterns with a dielectric constant different from the dielectric constant of the surrounding are (page 1 128, col. 2, lines 31-33), where a width of the insulating patterns being set larger than a width of a gap between the insulating patterns, and the variation of the electric field orientation in a pixel region (Fig. 1) (Page 1 127, col. 1, last paragraph).

Konovalov teaches the use of liquid crystal possessing negative dielectric anisotropy (see introduction) and a pair of polarizers (Fig. 2 description). In addition Konovalov teaches that the liquid crystal molecules in a tilted state when a voltage is applied across the electrodes (Fig. 1).

As to the limitation 'controlling an in-plane direction of the liquid crystal molecules when a voltage is applied across the electrodes', Konovalov teaches in (page 1 , col. 2,

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lines 1-8) that the dielectric ribs deposited across the electrode area is different from the longitudinal component of the dielectric susceptibility of the liquid crystal and due to this, after applying electric field to the opposite electrodes the component of the field parallel to the electrodes arises. This component governs the direction of the molecular inclination under electric field. Since the field is parallel to the electrodes, it is an 'in-plane field' and thus controls the in-plane direction of the liquid crystal molecules.

In Fig. 5 and in the description of the figure under 'electrooptic parameters' on page 3, Konovalov goes into extensive detail of how the liquid crystal molecules undergo transition to tilted state (single domain and M-domain VA modes) with the application of various voltages ranging from 2V to 3.8v. Hence these teachings of Konovalov are directly applicable to the newly added recited limitation in claim 1.

In response to the functional limitation recited in claim 1, i.e., "said liquid crystal layer including a first region in which liquid crystal molecules of said liquid crystal layer undergo transition to said tilted state upon application of a first voltage across said electrodes and a second region in which said liquid crystal molecules undergo transition to said tilted state upon application of a second voltage larger than said first voltage in magnitude across said electrodes", the functional use of the claimed invention must result in a structural difference between the claimed invention and the prior art in order to patentably distinguish the claimed invention from the prior art. If the prior art structure is capable of performing the functional use, then it meets the claim. See *In re Casey*, 152 USPQ 235 (CCPA 1967) and *In re Otto*, 136 USPQ 458, 459 (CCPA 1963).

Although Konovaloc discloses a pair of polarizers, the reference fails to specifically disclose them being disposed at respective outer sides of the substrates.

Koden discloses an LCD device having a pair of polarizers (fig. 2, ref. 10, 11; col. 8, lines 58-60) disposed at respective outer sides of the substrates.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to have a pair of polarizers disposed at respective outer sides of the substrates since it is well known in the art to place polarizers there. Furthermore, one would be motivated to polarize incoming light with orthogonal polarizing axes (col. 8, lines 58-60) for maximum control of LC molecules of continuously or stepwise threshold values (col. 3, lines 1-10;)

5. As to claim 4, Konovalov discloses the formation of a photoresist on the substrates (page 1 128, col. 2, lines 29-31) and patterning the photoresist layer to form the staggered state as shown in Fig. 1.

6. As to claim 5, Konovalov discloses a vedical alignment layer (page 1 128, col. 2, line 34) and that the liquid crystal is a nematic liquid crystal with a negative dielectric constant (page 1 127, col. 2, line 1 1).

7. As to claims 18 and 20, Konovalov discloses patterned and the independent nature of the insulating layer (photoresist layer).

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8. As to claim 21 and 27, Konovalov discloses electrodes in the absence of slits and the substrates are transparent (due to the absence of any reflector in the bottom substrate in Fig. 1).

9. Claims 3, 6, 9-16, 19, and 22-26 are rejected under 35 U.S.C. 103(a) as being unpatentable over Konovalov and Koden, and in further view of Hisatake et al. (U.S. Patent No. 5,434,690, hereafter "Hisatake").

10. As to claims 3, Konovalov, when modified by Koden, discloses the LCD device as recited above and although Konovalov discloses the formation of a photoresist layer and patterning it to form the insulating patterns, Konovalov does not explicitly disclose that the insulating patterns are connected with each other by an insulating film and that the thickness of the insulating patterns is different from the thickness of the insulating layer.

Hisatake discloses an LCD insulating patterns (22) on the two substrates that are connected with each other by an insulating film (17) and the thickness of the insulating patterns different from the insulating film (Fig. 30). (Please note the electric field patterns as shown in Fig. 30 that are similar to Konovalov.)

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to adapt the insulating patterns and the film disclosed by Hisatake to the device of Konovalov for providing a display that is capable of widening

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the angle of viewing field and to enhance the transmittance and increase the response speed while being driven at low driving voltages (col. 3, lines 36-43).

11. As to claims 6, 9-15, Konovalov, when modified by Kodon, discloses the LCD device as recited above, however, the reference does not explicitly disclose the electrode thickness, or the insulating layer being formed on only one substrate, or the positive dielectric constant of the liquid crystal, or the rubbing, or the electrical resistances and impedances, or the metal electrode, or the striped and zigzag nature of the insulating layer.

Hisatake discloses an LCD where the insulating layer is on only one substrate (Fig. 31A), the electrode is narrower than the insulating layer, a nematic liquid crystal with a positive dielectric constant (col. 5, lines 55-57), rubbing treatment of the alignment layers (col.10, lines 41-44), the insulating layer is made from either RTZ-206 or RTZ-606 (col. 27, lines 1-63) having a refractive index of 1.9 and the liquid crystal material is ZL1-3926 with an added chiral agent (S-81 1 ) (col. 23, lines 26-31). Since the two materials are different, the electrical resistance and the impedance of the two materials will also be different as recited in instant claims 9 and 12. Hisatake also discloses the connection of the insulating patterns with an insulating film (Fig. 30), conductive electrodes, the alignment layers (15 and 16) having a different thickness than the insulating layers (17 and 18) (Figs. 18, 30, 31A), plurality of stripes and the zigzag nature of the stripes (Figs. 25A and 25B), as recited in instant claims 13-15.



Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to adapt the insulating patterns and the film disclosed by Hisatake to the device of Konovalov for providing a display that is capable of widening the angle of viewing field and to enhance the transmittance and increase the response speed while being driven at low driving voltages (col. 3, lines 36-43). As to claim 16: Konovalov discloses the plurality of insulating layers are independent of one another (Fig. 1).

12. As to claims 19, and 22-26, Konovalov, when modified by Koden, discloses the LCD device as recited above, however, the reference does not disclose the slits in the insulating layer, nor the insulating layer provided on only one of the electrodes.

Hisatake discloses an LCD having slits in the insulating layer (Figs. 25-26), the arrangement with respect to the pixel area (col. 5, lines 23-40), insulating layer on the both the electrodes (Fig. 30), patterned nature of the insulating layer on the electrodes (figs. 1 and 30).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to adapt the insulating patterns and the film disclosed by Hisatake to the device of Konovalov for providing a display that is capable of widening the angle of viewing field and to enhance the transmittance and increase the response speed while being driven at low driving voltages (col. 3, lines 36-43).

### ***Response to Arguments***

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13. Applicant's arguments with respect to claims 1, 3-6, 9-16, 18-28 have been considered but are moot in view of the new ground(s) of rejection.


***Conclusion***

14. Any inquiry concerning this communication or earlier communications from the examiner should be directed to George Y. Wang whose telephone number is 571-272-2304. The examiner can normally be reached on M-F, 8 am - 4:30 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Robert H. Kim can be reached on 571-272-2293. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

gw  
July 25, 2005

  
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